REMARKS

In a final Office Action dated July 23, 2008, the Examiner denied Applicants' priority claim for certain claims, rejected the claims for obviousness-type double patenting, rejected some claims as anticipated by US Patent No. 5,358,776 and rejected some claims as obvious over combinations of US Patent Nos. 5,358,776, 6,265,153 and 6,762,059. The Examiner acknowledged that Claims 19 and 41 are free of the cited art.

Applicants respond to each rejection below. All newly presented amendments are intended to place the claims into condition for allowance. In view of the amendments above and the remarks below, Applicants respectfully request reconsideration of the merits of this application.

Priority Claim

The Examiner maintained that the asserted priority documents US Provisional Patent Application No. 60/419,884 and US Patent Nos. 5,720,928, 6,294,136 and 6,610,256 do not sufficiently support "periodically reversing the flow to cause the polymeric molecules to hover in an elongated state" as recited in Claims 10-16, 32-38 and 50-56. The Examiner accorded Claims 10-16, 32-38 and 50-56 a priority date of October 17, 2003, the application filing date.

As independent claims 1, 25 and 48 now include this limitation from Claims 10, 32 and 50, respectively, Applicants now rely upon the application filing date for priority for these claims, except insofar as the Examiner acknowledged the propriety of the priority claim relating to certain aspects of Claims 49-70, as pending at the time the most recent Office Action was mailed.

Rejections for Non-Statutory Obviousness-Type Double Patenting

The Examiner maintained rejections for obviousness-type double patenting. Claims 1, 4-7, 17, 25, 28-31, 39 and 45-48 were rejected over Claim 1 of US Patent No. 7,049,074 to Schwartz (hereinafter, Schwartz I), and Claims 1, 3-7, 17, 23-25, 27-31, 39 and 45-48 were rejected over Claims 1-2, 10, 12-13, 15-16 and 26-27 of US Patent No. 6,509,158 to Schwartz (hereinafter, Schwartz II). The Examiner alleged that Schwartz I and II render the rejected claims obvious by generally disclosing methods of elongating, fixing and characterizing polymeric molecules on a solid planar surface with a positive charge.

Prior-pending Claims 10, 32, and 50 and their dependents were not included in the rejection for obviousness-type double patenting. As the limitations of those claims are now incorporated into independent claims 1, 25 and 48, the claims now-pending and under examination are outside the scope of the rejection. Accordingly, reconsideration is respectfully requested.

Rejections Under 35 U.S.C. § 102

The Examiner maintained the rejection of Claims 1-7, 25-31, 48 and 62-64 as anticipated by US Patent No. 5,356,776 to Kambara *et al.* The Examiner alleged that Kambara *et al.* teaches a method of elongating polymeric molecules using laminar flow that anticipates Claim 1, a method of aligning polymeric molecules using laminar flow that anticipates Claim 25 and a method for separating polymeric molecules of differing molecular weights using laminar flow that anticipates Claim 48. Applicants respectfully disagree.

To support the rejection, the Examiner broadly defined the term "laminar flow" to include "instances where fluid or liquid flow is applied to a polymer for elongation or stretching" (*see*, pp. 20-21 of the Office Action) because the Specification allegedly failed to "explicitly define the term laminar flow." However, the skilled artisan understands with no further explanation that laminar flow is a streamlined flow that occurs when a fluid flows in parallel layers with no disruption between the layers, as in FIG. 2 of the application and in FIG. 25 of US Patent Nos. 6,610,256; 6,294,136 and 5,720,928. One of ordinary skill in the art also understands that non-laminar flow is not characterized by fluid flow in parallel layers with no disruption between the layers.

The Examiner was able to find allegedly relevant disclosure of "laminar flow" in a cited document only after concluding that laminar flow refers to any fluid or liquid flow applied to a polymer for elongation or stretching. The Examiner offered no basis for amending the art-accepted definition of laminar flow and, indeed, the Examiner's arbitrary definition is in striking contrast to the unambiguous art-accepted definition. In fact, however, laminar flow was not disclosed, intended or even possible in the work described in that document.

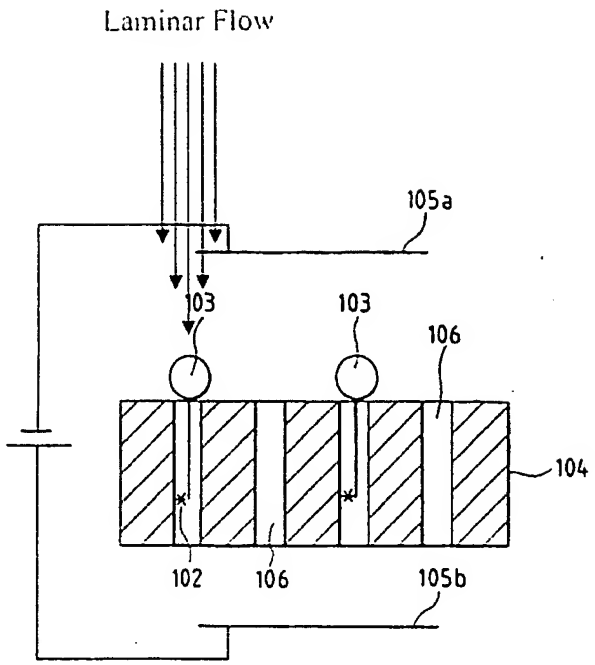
Applicants also traverse the Examiner's allegation that Applicants failed to provide a definition for the term. Since the meaning of "laminar flow" in Applicants' disclosure is fully

consistent with the art-accepted definition, it would have been improper for Applicants to offer some other, possibly inconsistent definition.

Under the art-accepted meaning of laminar flow, the Examiner has not presented a *prima facie* case as to how Kambara *et al.* anticipates the rejected claims by using laminar flow in a microchannel when one end of the microchannel is blocked by a bead/particle. While Applicants acknowledge, as before, that Kambara *et al.* discloses using a flow, Applicants maintain that Kambara *et al.* provided no more than passing references to using flow to elongate the polymeric molecules (*see, e.g.*, Column 3, lines 48-57; Column 4, lines 11-15; and Column 14, lines 27-29). More importantly, the bead/particle of Kambara *et al.* precludes laminar flow.

Shown below is FIG. 8B of Kambara *et al.*, which depicts polymeric molecules attached at one end to the bead/particle. Applicants once again respectfully ask the Examiner to consider how laminar flow (indicated by parallel arrows, which represent the parallel layers of flow found in laminar flow) can occur in a microchannel when one end of the channel is blocked or substantially blocked by a bead. Even if Kambara's generally contemplates fluid flow, Kambara cannot contemplate laminar flow, since the structures there disclosed would not permit laminar flow. If any flow can occur, it is necessarily turbulent flow, in which the fluid undergoes irregular fluctuations and mixing. Other forms of flow that may be present in Kambara *et al.* include sheath flow, electro-osmotic flow and/or capillary/convective flow. Regardless, these types of fluid flow are non-laminar and outside the scope of the claimed invention because they lack the parallel layers of laminar fluid flow.

Because Kambara *et al.* did not disclose, teach or suggest laminar flow (and indeed would make laminar flow impossible), it cannot anticipate the rejected claims.



In addition, and with respect to Claims 25 and 48, the Examiner ignored the limitation that a plurality of polymeric molecules pass in a laminar-flowing liquid through a microchannel. Nowhere did Kambara *et al.* disclose that more than one polymeric molecule could enter a microchannel. In fact, more than one polymeric molecule cannot pass through a microchannel in Kambara *et al.* given that only one polymeric molecule is attached per bead/particle (*see, e.g.*, the figure from Kambara *et al.* reproduced above) and given that the microchannel is sized so as to prevent the bead/particle from passing through the microchannel (*see, e.g.*, Column 4, lines 1-17; and Column 10, lines 48-62). In view of these remarks, Applicants respectfully request reconsideration of this rejection.

Rejections Under 35 U.S.C. § 103

The Examiner maintained the rejection of Claims 8-9, 17-18, 21-24, 39-41, 43-46 and 58-61 as obvious over Kambara, *supra*, in view of US Patent No. 6,265,153 to Bensimon *et al.* The Examiner alleged that although Kambara *et al.* does not disclose aligning or staging polymeric molecules within a passage or channel and that although Kambara *et al.* does not disclose that a wall can be electrostatically attractive to polymeric molecules, one of ordinary skill in the art

would find it obvious to do so after reading Bensimon *et al.* Unless the Examiner shows how laminar flow can occur in a microchannel when one end of the channel is blocked or substantially blocked by a bead, this rejection must fail.

The Examiner also maintained the rejection of Claims 10-16, 20, 32-38, 42, 49-57 and 65-70 as obvious over Kambara, *supra*, in view of Bensimon *et al.*, *supra*, in further view of US Patent No. 6,762,059 to Chan *et al.* The Examiner alleged even though Kambara *et al.* and Bensimon *et al.* did not disclose periodically reversing the flow to cause polymeric molecules to hover in an elongated state, one of ordinary skill in the art would find it obvious to do so after reading Chan *et al.* The amended independent claims now include the limitation found in cancelled Claims 10, 32 and 50.

Applicants' invention distinguishes over the cited documents at least by its use of laminar flow to elongate, align or separate polymeric molecules during passage through a microchannel, regardless of whether polymeric molecules are aligned/staged within a passage or whether a wall is electrostatically attractive to polymeric molecules.

Without Kambara *et al.*, neither Bensimon *et al.* nor Chan *et al.* can stand alone to reject the claims because none disclosed laminar flow (as acknowledged by the Examiner on pp. 22-23 of the Office Action) and because even if Chan disclosed the claimed "hovering," this could not be implemented in a laminar flow in accord with the claims using the Kambara arrangement, for the reasons discussed above. The Examiner has yet to explain to Applicants how two glass cover slips constitute a microchannel or how, practically speaking, one would combine the blocked-end arrangement of Kambara with the open-sided arrangement of Bensimon to arrive at a laminar flow arrangement as claimed.

The Examiner also presented a tortured reading of certain passages of Bensimon *et al.* to support the rejection. For example, in rejecting Claims 8-9, the Examiner alleged that Bensimon *et al.* disclosed multiple polymeric molecules being simultaneously passed through a microchannel (*see*, p. 9 of the Office Action where the Examiner cited Column 17, lines 18-23 of Bensimon *et al.*). That passage, however, related to an incubation for polymeric molecule attachment to a surface, which was "for about 1 hour at room temperature in an atmosphere saturated with water vapor (emphasis added). As indicated in previous responses, Bensimon *et al.* disclosed using capillary action/convection (principally caused by evaporation at a trailing edge of a solution) to create a meniscus that elongates, aligns or separates polymeric molecules

attached to a surface. *See*, FIG. 6; Column 1, lines 39-46; Column 2, lines 59-68; Column 17, lines 41-45; and Column 19, lines 30-32 of Bensimon *et al.* No meniscus flow occurs with saturated water vapor.

In view of these remarks, Applicants respectfully request reconsideration of this rejection.

Fees

No fee is believed due in connection with this submission. However, if a fee is due, in this or any subsequent response, please charge the fee to Deposit Account No. 17-0055. Likewise, no extension of time is believed due; however, if any extension is required in this or any subsequent response, please consider this to be a petition for the appropriate extension of time and a request to charge the petition fee due to the same Deposit Account.

This response is being filed within two months of the mailing date of the final office action.

Respectfully submitted,

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